

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Richard L. Baer

Application No.: 09/842,549

Filing Date: 4-25-2001

Title: EXPOSURE CONTROL IN A DIGITAL CAMERA



Confirmation No.: 7608

Examiner: Quiett C.

Group Art Unit: 2612

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 10-28-2005.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

() (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

() one month	\$120.00
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() three months	\$1020.00
() four months	\$1590.00

() The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of \$500.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Signature: Paul H. Horstmann

Respectfully submitted,

Richard L. Baer

By Paul H. Horstmann

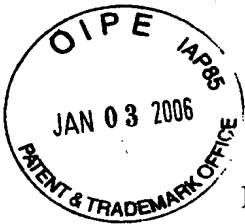
Paul H. Horstmann

Attorney/Agent for Applicant(s)

Reg. No. **36,167**

Date: **12-28-2005**

Telephone No.: **(310) 376-0218**



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Richard L. Baer

Application No: 09/842,549

Filed: 4-25-2001

For: EXPOSURE CONTROL IN A
DIGITAL CAMERA

Commissioner for Patents
P.O. Box 1450
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Examiner: Quiett C.

Art Unit: 2612

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Paul H.
Signature

12-28-2005
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Appellant's Brief (Pursuant to 37 C.F.R. §41.37)

Dear Sir:

Applicant/ Appellant submits this Appeal Brief in connection with the
above-referenced patent application which is on appeal to the Board of Patent
Appeals and Interferences.

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REAL PARTY IN INTEREST

The real party in interest in this application is Hewlett-Packard Development Company, L.P.

RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any other related appeals or interferences that may directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

Claims 1-12 stand rejected under 35 U.S.C. §102(e) in view of U.S. Patent No: 6,486,915 of *Bell et al.* ("*Bell*").

Appellant appeals the rejection of all of the pending claims 1-12. Claims 1-12 as currently pending are set forth in the attached Appendix.

STATUS OF AMENDMENTS

Appellant is unaware of any amendments filed after the Final Office Action mailed July 28, 2005 which finally rejected claims 1-12.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claims 1, 5, and 9 are directed to exposure control in a camera by determining a selected exposure in response to the numbers of clipped pixels contained in a set of photographs obtained using all possible exposure settings of the camera. Exposure control according to independent claims 1, 5, and 9 includes obtaining a photograph of an image scene for each of a set of possible exposures¹ and determining a number of clipped pixels in each photograph² and determining a selected exposure from the possible exposures in response to the numbers of clipped pixels.³

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

I: Rejection of claims 1-12 as being anticipated by *Bell*.

¹ See page 5, second paragraph and Figure 1, element 100 of Appellant's specification.

² See page 5, second paragraph and Figure 1, element 100 of Appellant's specification.

³ See page 5, fourth paragraph and Figure 1, element 102 of Appellant's specification.

ARGUMENT

I: Claims 1-12 are not anticipated by *Bell* because *Bell* does not disclose the limitations of independent claims 1, 5, and 9.

Appellant respectfully submits that claims 1, 5, and 9, and claims 2-4, 6-8, and 10-12 which depend from claims 1, 5, and 9, respectively, are not anticipated by *Bell* because *Bell* does not disclose the limitations in claims 1, 5, and 9 of exposure control by determining a selected exposure in response to the numbers of clipped pixels contained in a set of photographs obtained using all possible exposures. First of all, *Bell* does not disclose obtaining a set of photographs of an image scene using each of a set of possible exposures as claimed in claims 1, 5, and 9. Moreover, *Bell* does not disclose determining a number of clipped pixels in each of those obtained photographs as claimed in claims 1, 5, and 9. Furthermore, *Bell* does not disclose determining a selected exposure in response to the numbers of clipped pixels in those obtained photographs as claimed in claims 1, 5, and 9.

A. *Bell* does not disclose obtaining a set of photographs of an image scene using each of a set of possible exposures as claimed in claims 1, 5, and 9.

Appellant submits that *Bell* does not disclose obtaining a set of photographs of an image scene using each of a set of possible exposures as claimed in claims 1, 5, and 9. Instead, *Bell* teaches obtaining photographs using only the exposure settings that are selected by an automated search methodology. (*Bell*, col. 1 line 66 through col. 2, line 12). For example, *Bell* teaches

selecting one of a number of predetermined exposure settings as a current exposure setting...
(*Bell*, col. 1, line 67 – col. 2, line 1) (emphasis added) and then generating a captured image scene, i.e. a photograph, using the current exposure setting (*Bell*, col. 2, lines 2-4) and then repeatedly capturing photographs using other exposure settings until a photograph is captured that is neither overexposed or underexposed (*Bell*, col. 2, lines 4-9). It is submitted that repeatedly

capturing photographs until one with proper exposure is found as disclosed by *Bell* does not anticipate obtaining a set of photographs of an image scene using all of the possible exposures as claimed in claims 1, 5, and 9.

B. *Bell* does not disclose determining a number of clipped pixels in each of a set of photographs obtained using all possible exposures as claimed in claims 1, 5, and 9.

Appellant submits that *Bell* does not disclose determining a number of clipped pixels in each of a set of photographs obtained using all possible exposures as claimed in claims 1, 5, and 9. This follows from the fact that *Bell* does not disclose obtaining a set of photographs of an image scene using all possible exposures as claimed in claims 1, 5, and 9.

It is also submitted that *Bell* does not even disclose determining a number of clipped pixels in the photographs that *Bell* does obtain. *Bell* discloses an example exposure in which 5 percent of the total number of pixels in a sample window are clipped (*Bell*, col. 5, lines 13-22) but does not teach counting clipped pixels in an entire photograph. Instead, *Bell* uses the presence of clipped pixels in a sample window to adjust the size of the sample window to fit the dynamic range of a camera's imager. For example, *Bell* discloses a step 312 in which it is determined whether the number of clipped pixels in a sample window exceeds 5 percent of the total number of pixels in the sample window (*Bell*, col. 5, lines 13-22) and then states that

If the test in step 312 is true, then this means that the imager's dynamic range is far too small to capture the whole scene's dynamic range. Thus, the current sample window may not be the best window to determine the optimal exposure setting for this particular scene. In this case, operation will proceed with step 316 in which the sample window is reduced to concentrate effort on determining a final exposure for the main subject, which is likely positioned in the center of the scene.

(*Bell*, col. 5, lines 23-31) (emphasis added).

C. *Bell* does not disclose determining a selected exposure in response to the numbers of clipped pixels in a set of photographs obtained using all possible exposures as claimed in claims 1, 5, and 9.

Appellant submits that *Bell* does not disclose determining a selected exposure in response to the numbers of clipped pixels in a set of photographs obtained using all possible exposures as claimed in claims 1, 5, and 9. This follows from the fact that *Bell* does not disclose obtaining a set of photographs of an image scene using all possible exposures or determining a number of clipped pixels in each photograph as claimed in claims 1, 5, and 9.

In contrast to determining a selected exposure in response to the numbers of clipped pixels in obtained photographs as claimed in claims 1, 5, and 9, *Bell* determines an exposure setting in response to a maximum value in a pixel histogram and a mean value (*Bell*, col. 5, lines 59-61) and a minimum value in the pixel histogram (*Bell*, col. 5, line 66 through col. 6 line 1) and whether a mean value of the pixel histogram is within a tolerable range (*Bell*, col. 6, lines 21-25). *Bell* uses the maximum and mean histogram values to detect underexposure (*Bell*, col. 5, lines 55-61) and uses the minimum and mean histogram values to detect overexposure (*Bell*, col. 5, line 67 – col. 6, line 1).

In response to appellant's argument that *Bell* does not teach determining a selected exposure in response to the numbers of clipped pixels contained in obtained photographs as claimed in claim 1, 5, and 9, the examiner has stated that Figure 6 of *Bell* shows that the numbers of clipped pixels are higher if an exposure is increased. (Page 3, lines 5-6, Office Action, 7-28-05). Appellant respectfully submits that even if *Bell* were⁴ to teach that the numbers of clipped pixels are higher if an exposure is increased, *Bell* does not use that information to select an exposure as claimed in claims 1, 5, and 9.

⁴ Appellant submits that Figure 6 of *Bell* shows an optimal exposure without clipping rather than increased clipping in an increased exposure as stated by the examiner. See col. 2, line 35-36 and col. 6, lines 21-25 of *Bell*.

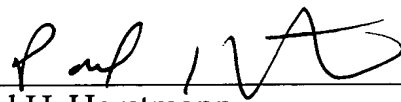
CONCLUSION

Appellant respectfully submits that the stated rejections cannot be maintained in view of the arguments set forth above. Appellant respectfully submits that all of the claims 1-12 are patentable under 35 U.S.C. §102 over the references cited by the Examiner and requests that the Board of Patent Appeals and Interferences direct allowance of the rejected claims.

Respectfully submitted,

By

Date: 12-28-2005



Paul H. Horstmann
Reg. No. 36,167

CLAIMS APPENDIX

1. A method for exposure control, comprising:
 - obtaining a photograph of an image scene for each of a set of possible exposures;
 - determining a number of clipped pixels in each photograph;
 - determining a selected exposure from the possible exposures in response to the numbers of clipped pixels such that the photographs obtained using the possible exposures higher than the selected exposure have an increased value for the number and the photographs obtained using the possible exposures less than the selected exposure do not have a substantially lower value for the number.

2. The method of claim 1, wherein determining a number of clipped pixels comprises:
 - measuring an amplitude of each of a set of pixels in the corresponding photograph;
 - generating a histogram of a number of the pixels from the corresponding photograph verses the corresponding amplitude;
 - detecting a jump in the number of pixels at a high pixel amplitude.

3. The method of claim 1, wherein determining a number of clipped pixels comprises:
 - setting a starting exposure and determining the number of clipped pixels from the corresponding photograph for the starting exposure;
 - setting a series of increased exposures and determining the number of clipped pixels from the corresponding photographs for the increased exposures;
 - setting a series of decreased exposures and determining the number of clipped pixels from the corresponding photographs for the decreased exposures.

4. The method of claim 1, wherein determining a selected exposure comprises:
 - determining a subset of the possible exposures for which the number is relatively unchanged;
 - determining a first one of the possible exposures higher than the subset for which the number increases.
5. An apparatus for exposure control, comprising:
 - means for obtaining a photograph of an image scene for each of a set of possible exposures;
 - means for determining a number of clipped pixels in each photograph;
 - means for determining a selected exposure from the possible exposures in response to the numbers of clipped pixels such that the photographs obtained using the possible exposures higher than the selected exposure have an increased value for the number and the photographs obtained using the possible exposures less than the selected exposure do not have a substantially lower value for the number.
6. The apparatus of claim 5, wherein the means for determining a number of clipped pixels comprises:
 - means for measuring an amplitude of each of a set of pixels in the corresponding photograph;
 - means for generating a histogram of a number of the pixels from the corresponding photograph verses the corresponding amplitude;
 - means for detecting a jump in the number of pixels at a high pixel amplitude.
7. The apparatus of claim 5, wherein the means for determining a number of clipped pixels comprises:

means for setting a starting exposure and determining the number of clipped pixels from the corresponding photograph for the starting exposure;

means for setting a series of increased exposures and determining the number of clipped pixels from the corresponding photographs for the increased exposures;

means for setting a series of decreased exposures and determining the number of clipped pixels from the corresponding photographs for the decreased exposures.

8. The apparatus of claim 5, wherein the means for determining a selected exposure comprises:

means for determining a subset of the possible exposures for which the number is relatively unchanged;

means for determining a first one of the possible exposures higher than the subset for which the number increases.

9. A digital camera, comprising:

image sensor;

exposure mechanism that provides a set of possible exposures to the image sensor from an image scene;

image processor that obtains a photograph of an image scene for each of the possible exposures and that determines a number of clipped pixels in each photograph and that determines a selected exposure from the possible exposures in response to the numbers of clipped pixels such that the photographs obtained using the possible exposures higher than the selected exposure have an increased value for the number and the photographs obtained using the possible exposures less than the selected exposure do not have a substantially lower value for the number.

10. The digital camera of claim 9, wherein the image processor determines the number of clipped pixels by using the image sensor to measure an amplitude of each of a set of pixels in the corresponding photograph and then generating a histogram of a number of the pixels from the corresponding photograph verses the corresponding amplitude and then detecting a jump in the number of pixels at a high pixel amplitude.

11. The digital camera of claim 9, wherein the image processor determines the number of clipped pixels by setting a starting exposure using the exposure mechanism and then determining the number of clipped pixels from the corresponding photograph for the starting exposure and setting a series of increased exposures and decreased exposures using the exposure mechanism while determining the number of clipped pixels from the corresponding photographs.

12. The digital camera of claim 9, wherein the image processor determines a selected exposure by determining a subset of the possible exposures for which the number is relatively unchanged and by determining a first one of the possible exposures higher than the subset for which the number increases.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.